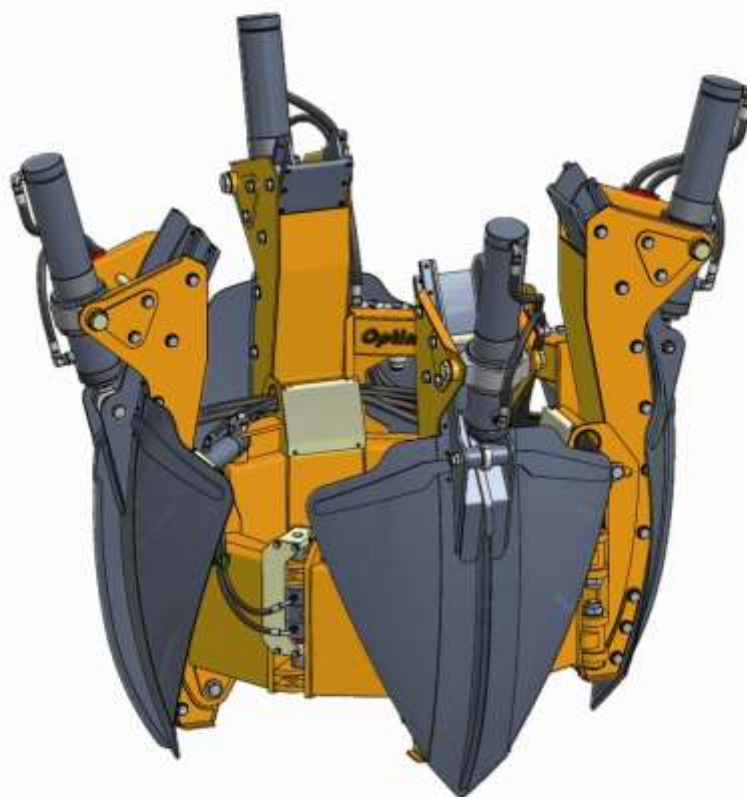




M A N U A L

O N

TREE SPADE OPTIMAL 1400

**Manufacturer:**

Optimal-Vertrieb Opitz GmbH
Eysölden M 41
91177 Thalmaessing
Germany

Phone: ++ 49 - 9173 - 79 18 0
Fax: ++ 49 - 9173 - 79 18 49
eMail: info@opitz-optimal.com
web: www.opitz-optimal.com

Distributor:

Fieldworks Nursery Equipment
5191 Dawes Rd
Grand Bay AL 36541
U.S.A.

Phone: (251) 490-9871
Email: Fieldgrown@gmail.com
Email: Sales@optimaltreespades.com
Web: www.OptimalTreeSpades.com

C O N T E N T S

	Page
Safety Warnings	3
1. Operating Specifications	5
2. Assembly	6
3. Putting into Service	7
4. Operating Instructions	8 – 10
5. Care and Maintenance	11 – 14
6. Appendix	
6.1 Attachment Points	15
6.2 Wiring diagram for Control Box	16
6.3 Wiring diagram for Control System	17
6.4 Hydraulic systems	18
6.5 Lubrication chart	19
7. Trouble Shooting	20 -21
8. Warranty	22
9. Spare Parts List with Drawings	23 - 45
table 1 basic machine	
table 2 spades	
table 3 telescopic spade cylinder	
table 4 gate cylinder	
table 5 gate lock cylinder	
table 6 hydraulic system	
table 7 electric controls	



WARNING

Operator must have read and understood instructions before running the tree spade.

Untrained operators can cause injury or death.



Safety Alert Symbol: This symbol is used for important safety messages. When you see this symbol, follow the message to avoid personal injury or death.



Never use tree spade without instructions. See machine signs (decals), and Operation & Maintenance Manual of tree spade. The operation instructions for power unit must be followed.



Before starting operations, bolts and hydraulic fittings must be checked to make sure they are free of damage and well tightened. Defective or loose hose pipes might cause serious injuries and therefore must be replaced immediately.



The operator is responsible for ensuring that no person is near the tree spade when in operation.



No one should be underneath the raised tree spade or near shearing and pinching areas, or near any hydraulic components. We are advising the user that due to their functional positions and movements the danger areas cannot be furnished with protective guards.



Keep bystanders well away from work area.



Do not perform any manual work on the tree or shrub when it is inside the tree spade. In particular, do not check the position of the tree or shrub by hand or feet when it is inside the tree spade. Do not tie the tree or shrub when it is near or inside the machine.



When sight is limited, an assistant should direct the operator by hand signals.



When driving, the tree spade should be in the lowest possible position. When moving and working on public roads, the traffic rules and regulations must be adhered to.



Never leave power unit with engine running or with lift arms up.



To park, engage parking brake and put tree spade flat on the ground.



When doing cleaning, maintenance or repair work, lower the tree spade to the ground and stop the engine of the power unit.



Never modify equipment. Use only original spare parts approved by manufacturer for this particular model tree spade.



When digging, it might happen that a stone gets caught between two blades and the blades get bent. This causes tremendous tension in the steel blade. Do not try to release the stone by means of a crow bar or other tools. Place the digging head again into the planting hole and retract the blades. Thereby the stone will come loose and the blades which got a high degree of bending strength will regain their former shape. After that the root ball can be dug again.



The operator must be sure that the ground he is going to dig is free from any underground installations such as cables, pipes or any other utilities or dangerous matter. Damaging such underground installations or matter is dangerous and might result in serious injury or death.



Safety stickers have been placed on the tree spade to warn the user of possible dangers. In case a safety sticker has been worn or destroyed, it must be replaced immediately. Safety stickers can be ordered with your distributor or the manufacturer. For ordering please use the part numbers listed on page 2A. Fix the stickers on the locations marked on page 2A.

1. Tower:



Part N° 7118000001



KEEP AWAY
FROM SWING AREA
WHEN IN OPERATION

Part N° 7118000008



NO SE ACERQUE A LA
ZONA DE MOVIMIENTO
CUANDO ESTÁ
EN FUNCIONAMIENTO

Part N° 7118000015

5. Gate Cylinder:



Part N° 7118000007

2. Tower:



Part N° 7118000001



AVOID INJURY
Stay Clear!
This structure
swings outward

Part N° 7118000012



EVÍTESE LA HERIDA
¡No se acerque!
Esta estructura
mueve hacia afuera

Part N° 7118000020



Part N° 7118000018

7. Frame:



Part N° 7118000004



Part N° 7118000006

8. Frame

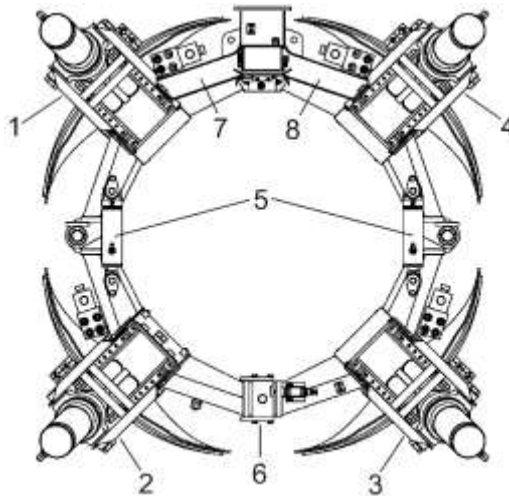
WARNING
SAFETY
FRAME
AVOID
SERVICE

Part N° 7118000010



For the max. permissible
hydraulic working pressure
and flow rate, please refer to
the User's Manual

Part N° 7118000086



4. Tower:



Part N° 7118000001



AVOID INJURY
Stay Clear
Of
Elevated Unit
And Tree Spade

Part N° 7118000009



EVÍTESE LA HERIDA
No se acerque
ni la unidad elevada
ni la transplantadora

Part N° 7118000016

5. Gate Cylinder:



Part N° 7118000007

3. Tower:



Part N° 7118000001



MOVING MACHINERY
KEEP HANDS AND
FEET CLEAR

Part N° 7118000014

6. Lock Cylinder:



Part N° 7118000019



MAQUINARIA EN MOVIMIENTO
MANTENGA MANOS Y PIES
ALEJADOS

Part N° 7118000017



WATCH YOUR
HANDS AND
FINGERS

Part N° 7118000013

1. Operating Specifications

Description	Tree Spade OPTIMAL 1400	
serial number	141	
capacity	upper root ball diameter	140 cm (55")
	root ball depth	90 cm (35")
dimensions of basic machine	height	180 cm (71")
	width, frame closed	165 cm (65")
	width, frame open	260 cm (102")
	clearance between open gate	96 cm (38")
weight	basic machine, empty	1595 kg (3509 lbs.)
rated type of attachment	attachment by means of back plate to loader or excavator	
	minimum lift capacity	3500 kg (7700 lbs.)
	the power unit must be equipped with an auxiliary double-acting hydraulic circuit for implements:	
	working pressure	160 - 200 bar (2300-2900 lbs/in ²)
	oil flow	50 - 80 l/min. (13 - 21 GPM)
controls	electro-hydraulic valves, double-acting, for four functions; relief valve integrated in valve bank; actuation by electric control box; max. power input 12 Ampere	
field of application	tree nurseries; gardens; civic greens	

2. Assembly



IMPORTANT:

When doing assembly work, heed relevant instructions of manufacturers of power unit!

2.1 Back Plate

The tree spade is attached to the power unit by means of a back plate. The back plate is procured from the manufacturer of the power unit, or it might be fabricated according to the drawings and instructions of the manufacturer of the power unit.

The back plate is to be furnished with borings as per drawing page 15. At these attachment points the tree spade is bolted tightly to the back plate.

2.2 Installation of Electro-Hydraulic Control (wiring diagram page 16/17)

- 2.2.1 Install control box at suitable place in the cabin, e.g. at dashboard
- 2.2.2 Install 13-pole socket next to the push-on connector for the implement hydraulics. A mounting bracket has been provided.
- 2.2.3 Run 12-pole cable from control box to 13-pole socket.
- 2.2.4 The control box must be connected to the power supply (12V) of the power unit.

***Important: Electric power should be flowing only when the ignition of the power unit is activated, otherwise the battery may run down.
Maximum power input 12 Ampere !***

Now the tree spade is ready for operation.

3. Putting into Service

The tree spade with the back plate is attached and secured to the power unit.

Both the hydraulic connecting hoses of the tree spade are to be connected to the hydraulic disconnect of the auxiliary hydraulic circuit of the power unit.

The plug of the electric control cable is to be plugged into the socket on the power unit (see section 2.2.2).

Make sure that hydraulic working pressure and oil flow of power unit meets the requirements as laid down in the operating specifications on page 3.



IMPORTANT:

The hydraulic disconnect of the tree spade and the power unit must match and must be connected properly. Faulty connections are extremely dangerous.

After the first working day, the screws of the tension blocks must be checked and re-tightened, if necessary.

When operating the power unit, follow the instructions of the operating manual of the power unit !

4. Operating Instructions



IMPORTANT:

The Operator must be a reliable person. Before commencing production work, he or she must study these operating instructions thoroughly.

The following safety instructions must be observed:

It is the operator's prime duty to ensure that any persons must stay clear off the danger area. Special care must be taken that no one is ever under the raised tree spade, or near the potential shearing and pinching areas, or near the opened gate, near the spades or near any hydraulic components.

Do not perform any manual work at the tree or shrub when it is inside the tree spade. In particular, do not check the position of the tree or shrub by hand or feet when it is inside the tree spade. Do not bind the tree or shrub when it is near or inside the machine.

When sight is limited, an assistant should direct the operator by hand signals.

Before starting to work with the tree spade, make sure the hydraulic fittings and the bolts are properly tightened and are free from any defects.

4.1 Control Box

The work movements are controlled as follows:

Pre-Selector

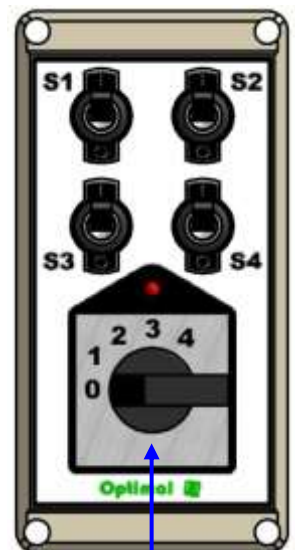
Manual Controls (hydraulic)

0 : control box switched off (LED light indicates when gate is not locked)	
function 1 : gate lock	unlock / lock
function 2 : gate	open / close
function 3 : blades	up / down
function 4 : stabilizers (optional)	up / down

The control box is installed in the driver's cabin. The function required is preset with the pre-selector of the control box, and it is then activated by means of the manual control lever or pedal respectively.

The tree spade is equipped with individual blade control as standard, i.e. each blade can be controlled individually with toggle switches S1, S2; S3 and S4.

Individual blade control is of particular advantage when soil conditions are difficult.



Pre-Selector

4.2 Operation

4.2.1 Lower the tree spade with the lift arms of the power unit until the blade points are about 20 cm (8") above the ground.

4.2.2 To open the gate, the gate lock must be unlocked first:
pre-selector: function 1, gate lock
manual control: unlock

4.2.3 Now the gate can be opened:
pre-selector: function 2, gate
manual control: open

4.2.4 With the gate wide open, the tree spade is driven towards the tree to be dug. Position the tree into the centre of the circular frame of the tree spade, then close the gate:
pre-selector: function 2, gate
manual control: close

4.2.5 Lock the gate:
pre-selector: function 1, gate lock
manual control: lock

It is of utmost importance to lock the gate before digging. It must never be forgotten because digging with an unlocked gate will bend the frame!

A safety switch ensures that the tree spade digs only when the gate is properly locked. Furthermore, a red control lamp will light up to indicate that the gate is not locked.

4.2.6 When having locked the gate, the tree spade is lowered to the ground and brought into a level position by means of the lift arms of the power unit.
Again check if the tree is positioned in the centre of the frame, and correct, if necessary.

4.2.7 In case the power unit had been furnished with rear stabilizers of its own, extend rear stabilizers with the respective control valve of the power unit.
But in case stabilizers have been installed with the tree spade and they are controlled by Optimal control box, extend rear stabilizers by setting
pre-selector: function 4 (optional), rear stabilizers
manual control: down

4.2.8 Now proceed with digging:
pre-selector: function 3, blades (S1-S4)
manual control: down

The blades are pressed into the soil by means of spade cylinders suspended at the spade towers. When all four blades are activated simultaneously, only the blades which encounter the least soil resistance are moving at a given time.

In the event the tree spade lifts from the ground, retract the blades slightly (manual control: "up") and then dig again, or press the blades down one by one, or by opposite pairs. In either case, the digging movements must be carried out step by step, until all blades are completely pressed into the soil. **When digging, do not rock the tree spade forward and backward by means of the tilting cylinder of the power unit!**

- 4.2.9 Once all blades have been completely pressed into the soil, the tree spade with the planting material is lifted out of the ground by means of the lift arms of the power unit.
- 4.2.10 The root ball is lowered by means of the lift arms of the power unit.
Then the gate is unlocked:
pre-selector: function 1, gate lock
manual control: unlock
and the gate is opened:
pre-selector: function 2, gate
manual control: open
- 4.2.11 The rear stabilizers are retracted with the control valve of the loader, or with the optional function 4 (up) of the pre-selector.
- 4.2.12 When work has been accomplished, the pre-selector is set to 0.



IMPORTANT: When moving and working on public roads, the traffic rules and regulations must be adhered to.

When driving, the tree spade should be in the lowest possible position.

When digging, it might happen that a stone gets caught between two blades and the blades get bent. This causes tremendous tension in the steel blade. Do not try to release the stone by means of a crow bar or other tools.

Place the digging head again into the planting hole and retract the blades. Thereby the stone will come loose and the blades which got a high degree of bending strength will regain their former shape. After that the root ball can be dug again.

4.3 Releasing the Tree

When transplanting, or when placing the tree in a basket, lower the tree spade by means of the lift arms, retract spades (function 3 "blades", control valve "up") then unlock gate (function 1 "gate lock", control valve "unlock") and open gate (function 2 "gate", control valve "open").

When the work has been finished, set the pre-selector in off-position (function 0).
If the tree spade is controlled by means of a joy stick, the hydraulics are off when no button is being pressed.

5. Care and Maintenance



IMPORTANT:

Tree spade must be lowered to the ground and switched off when doing cleaning, maintenance or repair work !

Use original spare parts only !

The tree Spade must be inspected by an expert on operational safety once per year !

Do not alter the design of the tree spade without having consulted the manufacturer !

Check screws regularly on tight fit. Tighten firmly, if necessary !

5.1 Blade Guides

Thanks to the plastic lining the spade guides do not require special care. Once the plastic lining has been worn, to the point where the heads of the countersunk screws are even with the surface of the plastic linings, they must be replaced to prevent the screws from damaging the blades.



IMPORTANT:

Keep the guides cleaned.

5.2 Lubrication

Once per week lubricate all greasing points with lithium-based grease, as per lubrication chart, Page 19

5.3 Hydraulic Oil Supply

Check level of hydraulic oil regularly. For checking, retract all blades “up” and lower the tree spade to the ground. If in that position the oil level is below the mark of the sight glass, oil must be refilled.

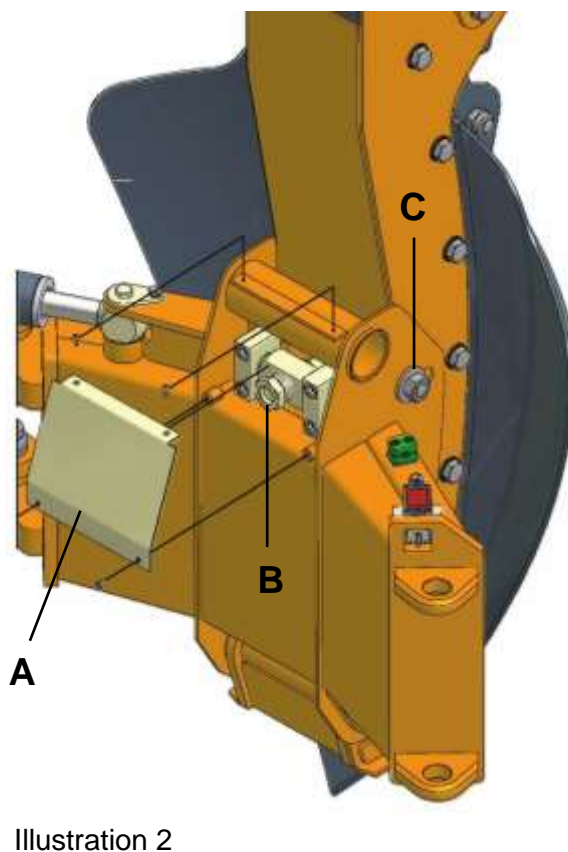
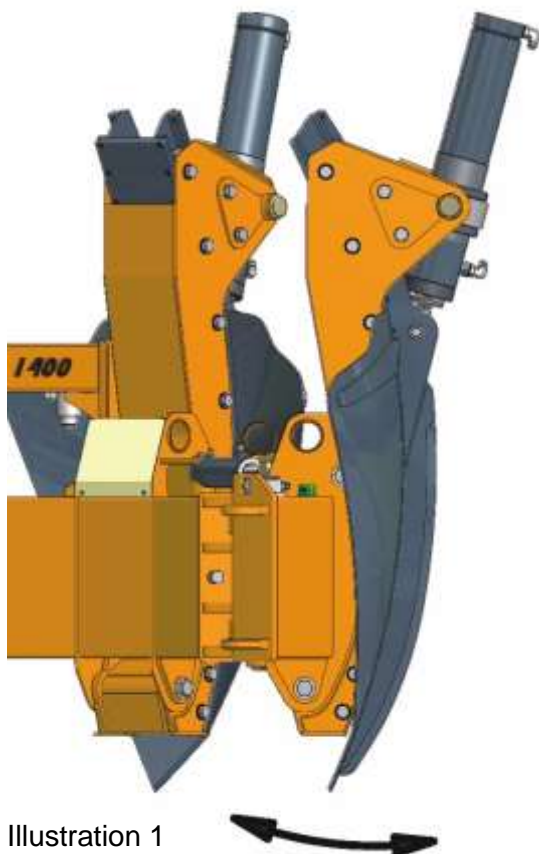
5.4 Hydraulic Hoses

All hydraulic hoses must be inspected at least once per year. Damaged hoses must be replaced. At least after 6 years all hoses must be replaced.

5.5 Cylinders

In case the tree spade is not getting used for two weeks, all piston rods of the hydraulic cylinders must be cleaned and covered with a preserving oil film.

5.6 Adjusting Blades



1. Overall view of spade tower
2. A guard
B adjustment screw
C locking screw
3. Loosen screws of guard A and remove guard. Loosen locking screw C. Use adjustment screw B to incline spade tower forward or backward until it is in the required position. Tighten locking screw C fast and reassemble guard.

In case the blades cannot be adjusted to the required position, check blade guides and plastic linings. Replace them, if necessary. In case guides and linings are in good condition, the tip of the blades might be bent and must be reshaped.

Important: The blades must be bent in **cold** condition by means of a hydraulic press. **The Blades must never be heated!!!**

5.7 Replacing Plastic Bushings at Blade Cylinder

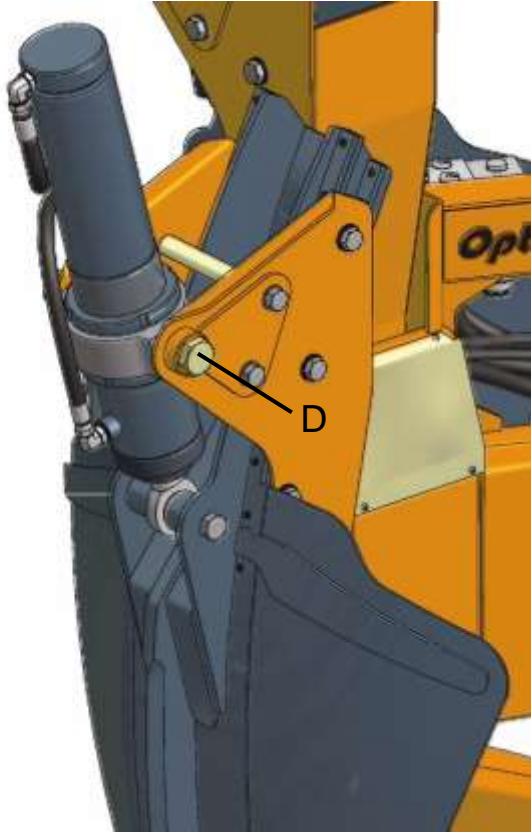


Illustration 4

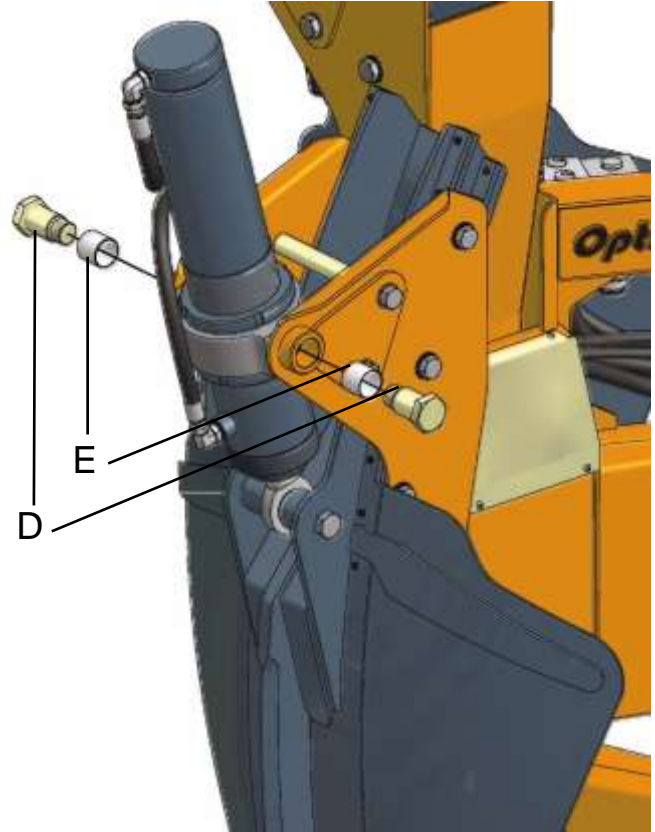


Illustration 5

Loosen adjustment pin D, replace plastic bushings E.
Then tighten adjustment pin D with a torque of 420 Nm.

5.8 Replacing Plastic Bushings at Gate Cylinder

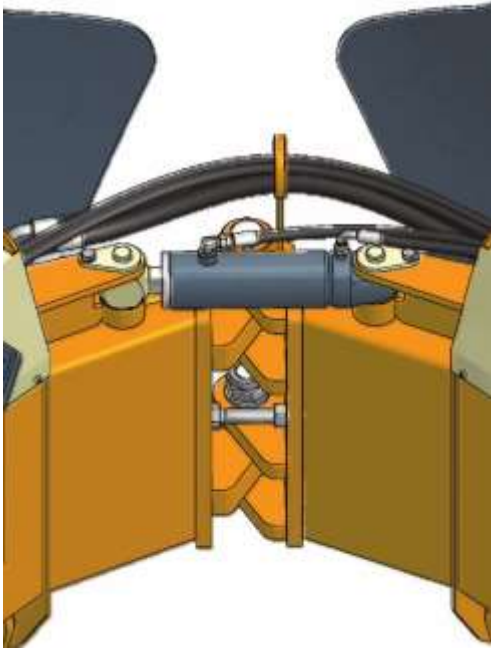


Illustration 6

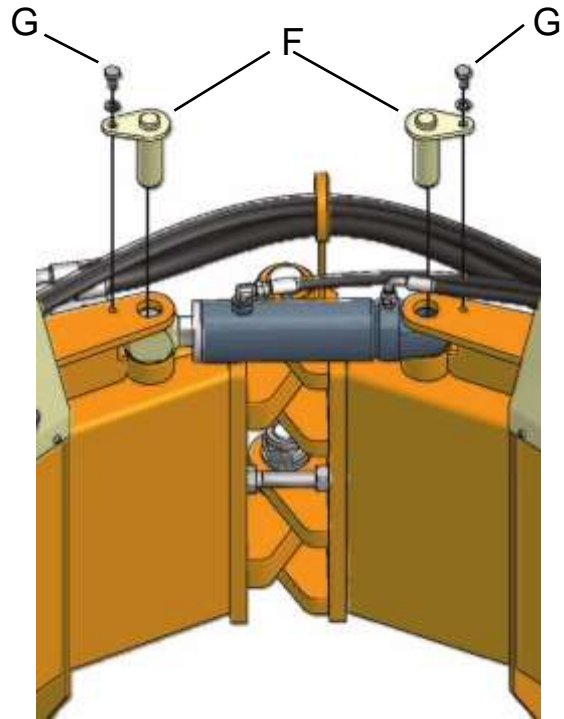


Illustration 7

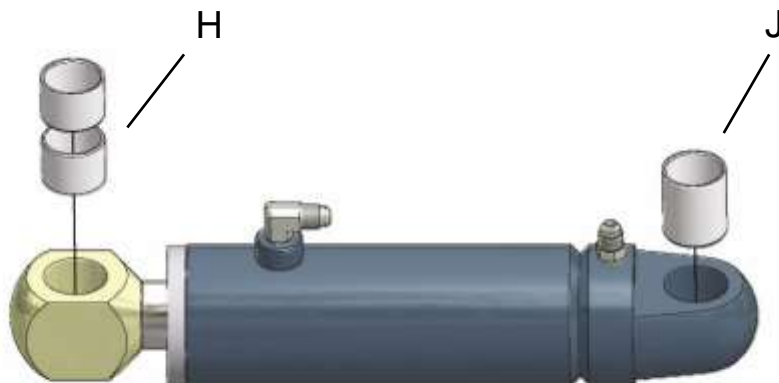


Illustration 8

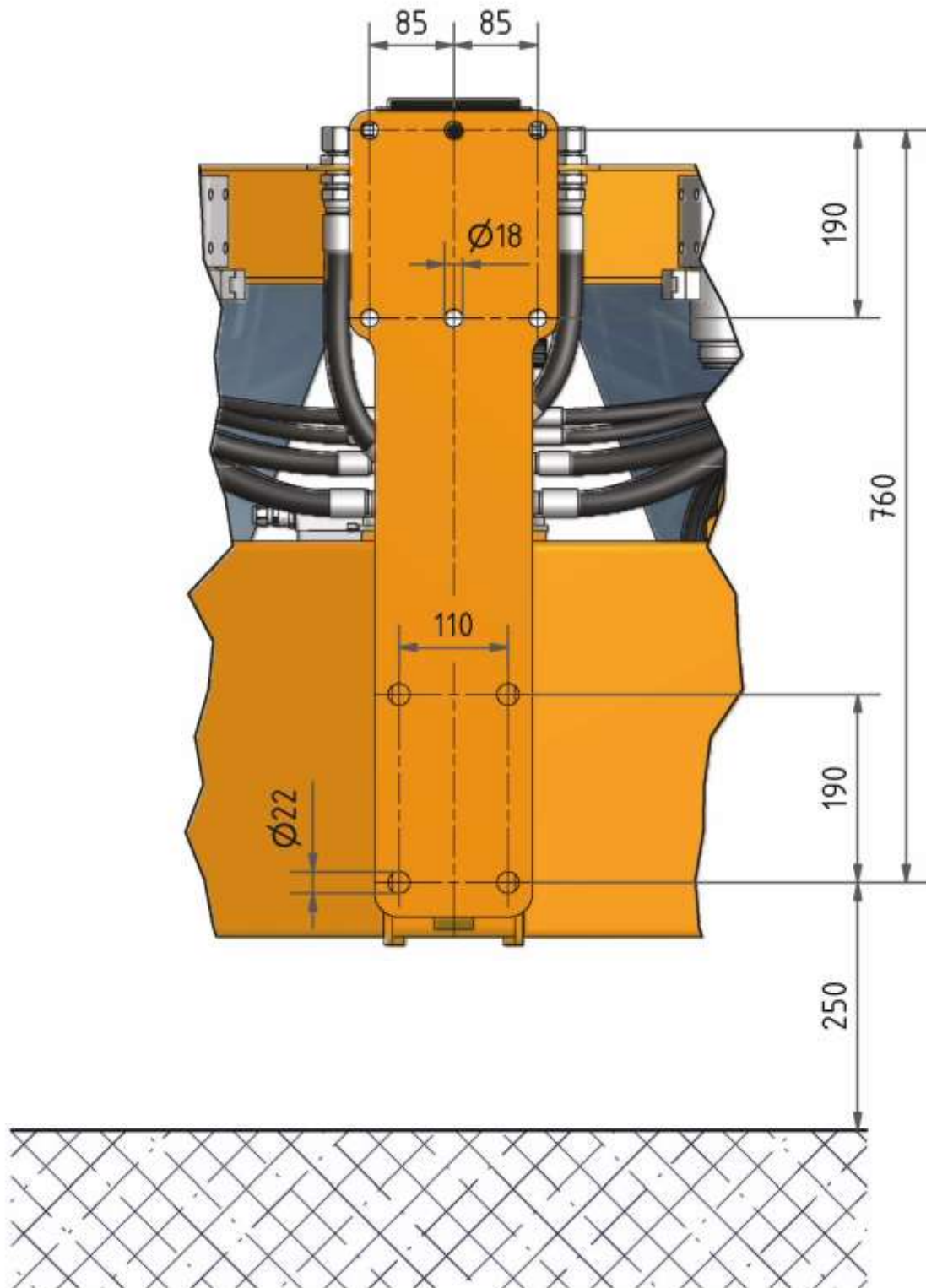
Illustration 6: Overall view of gate cylinder in position.

Illustration 7: Loosen hex screw G (M10x20) and remove pin F. If necessary, remove hydraulic hoses, too.

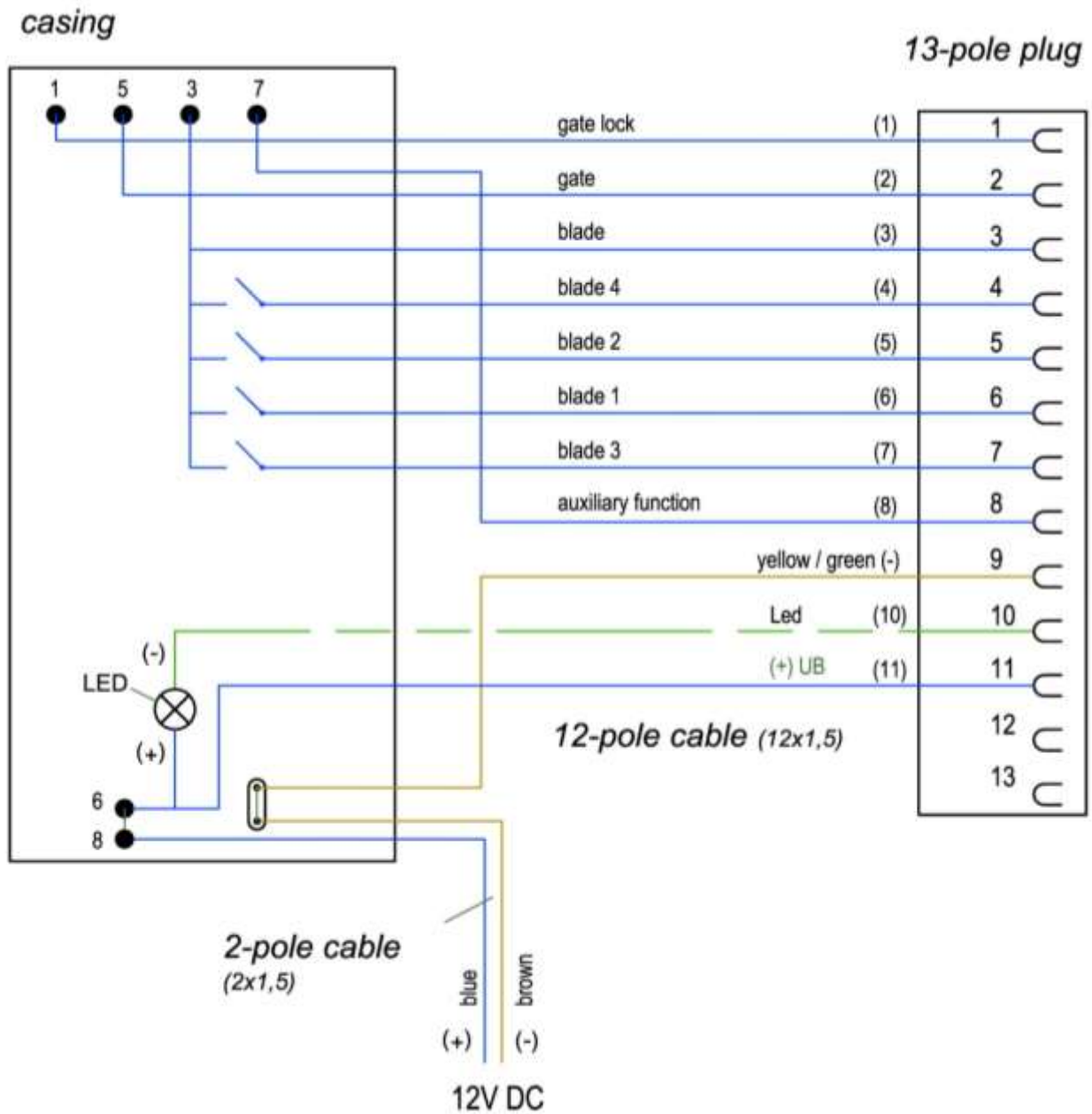
Illustration 8: Remove plastic bushings H and J with suitable object and insert new bushings.

Then reassemble gate cylinder, pin, hex screw and – if applicable – hydraulic hoses.

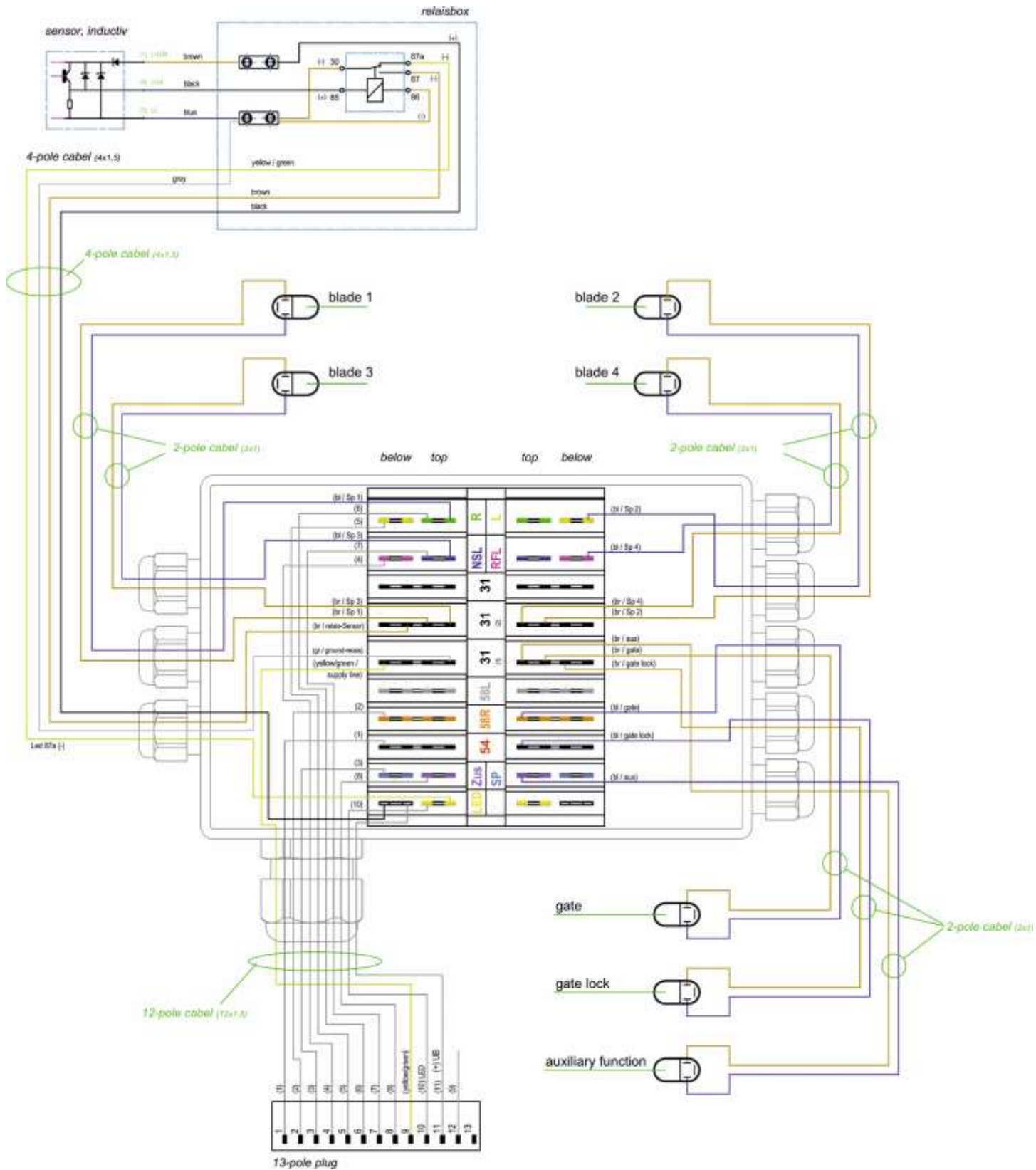
6.1 Attachment points



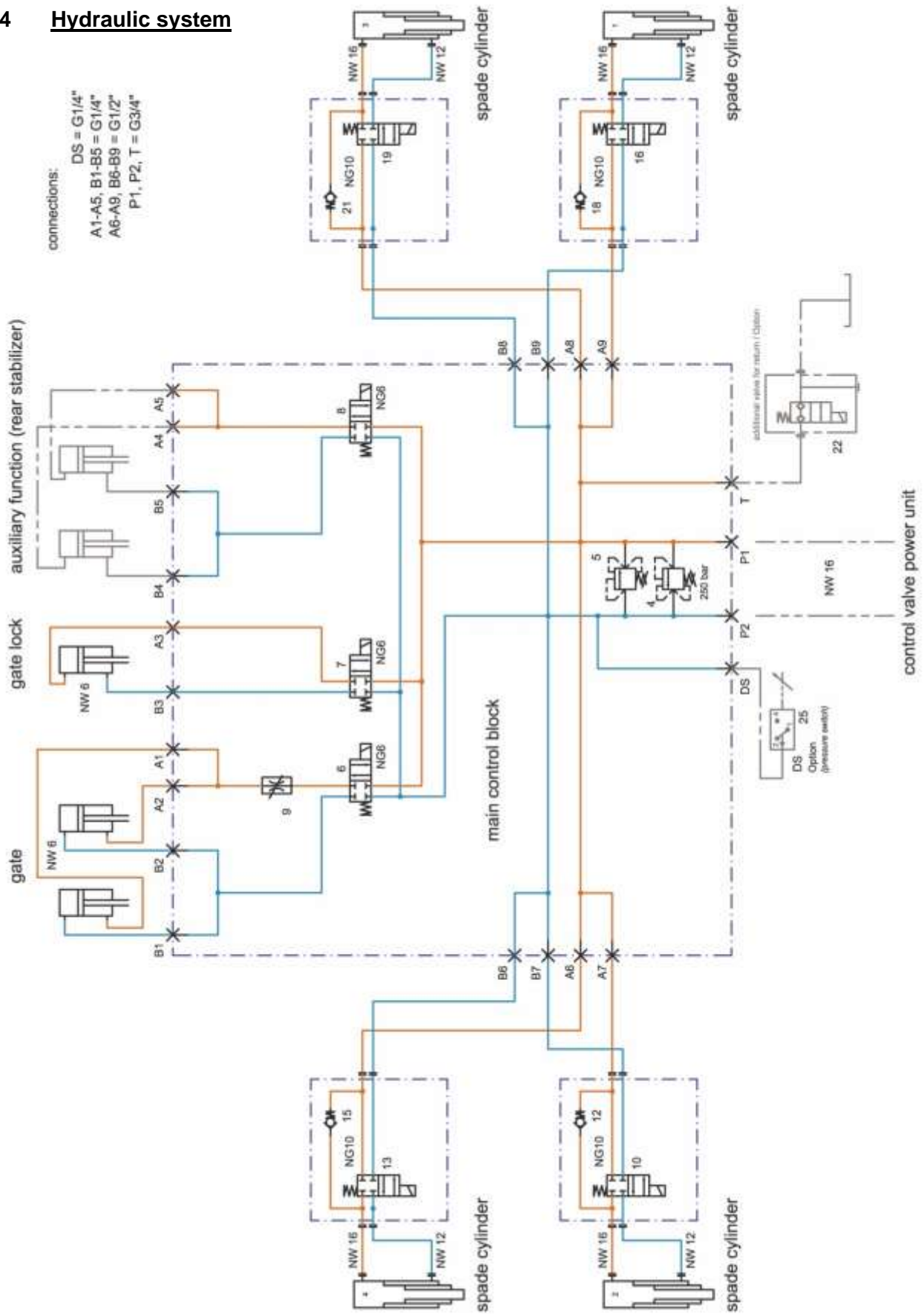
6.2 Wiring Diagram for Control Box



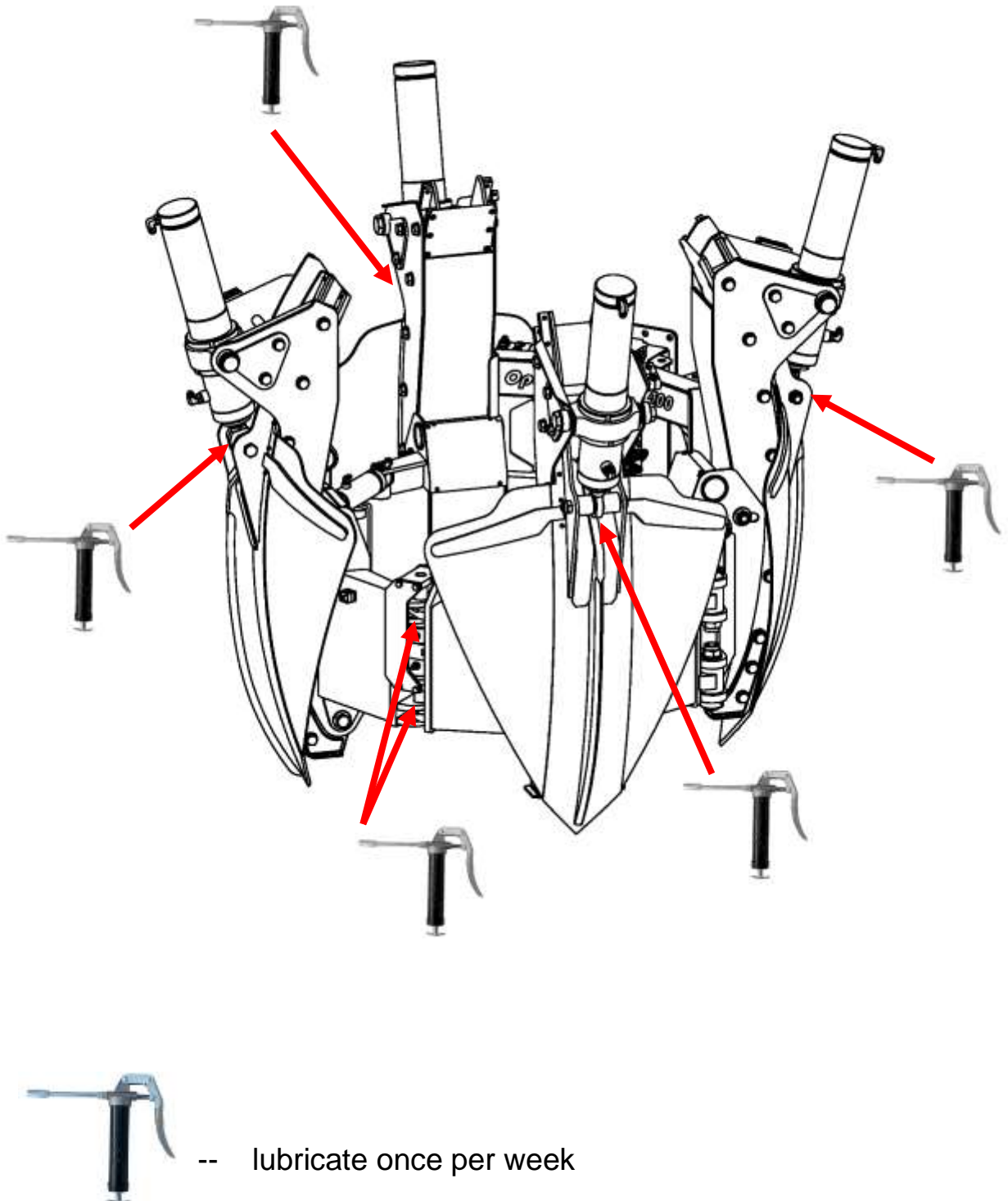
6.3 Wiring Diagram for Control System



6.4 Hydraulic system



6.5 lubrication chart



Trouble Shooting

1. Nothing moves. (none of the hydraulic functions works)
 - Electricity supply to control box is interrupted. Check fuses at power unit.
 - Hydraulic disconnect is not properly attached. Check attachment.

2. Two hydraulic functions (e.g. gate lock and spades) work at the same time.
 - On one of the valves the plunger does not move.
This defect might be caused by a dirt particle. Disassemble and clean the respective valve.
 - If this does not solve the problem, the valve is damaged and must be replaced.

3. After the blades have been retracted and the valve has been relieved, they immediately move down again.
 - If the spades move down a short way only, the oil supply of the pump might be too high.
Oil flow of power unit must be regulated by service of manufacturer.
 - If the spades move down all the way, the seals in the spade cylinder might be defect und must be replaced.
 - If the spades move down all the way, the spade valve might be defect and must be replaced.

4. The gate does not close and / or lock completely.
 - The adjustment screw at the hinge wants readjustment.
Adjust adjustment screw.
 - The eye joint is worn, bushes must be replaced.

5. Although the gate has been closed and locked properly, the blades do not move down.
 - The safety switch at the lock needs readjustment.
 - The electricity supply is interrupted. Check fuses at power unit.

6. The blades do not close properly although the spade cylinders are fully extended.
 - Guides are worn and must be replaced.
 - Blades are bent and have to be adjusted.

7. One function (any) does not work.
 - The electricity supply is interrupted. Check power circuit.
 - The magnet of the respective control valve is defect. Valve must be replaced.
 - The plunger of the control valve is seized, probably due to a dirt particle in the hydraulic oil. Disassemble valve and clean.



LIMITED WARRANTY

Optimal-Vertrieb Opitz GmbH ("Opitz") warrants that this product will be free from defects in material and workmanship for a period of 6 months from the date of purchase (the "Warranty Period"). If, during the Warranty Period, this product proves to be defective, Opitz will remedy the defect by either repairing or replacing the product or any of its defective parts, at Opitz's option.

If you need warranty service, you must, prior to the lapse of the Warranty Period, file a claim, together with proof of purchase and your original Warranty Certificate received at the purchase of the product, with Fieldworks Nursery Equipment, Grand Bay AL 36541; USA. After a warranty claim is properly filed, Opitz or its designated representative will evaluate the warranty claim. This warranty is conditioned upon your reasonable cooperation with Opitz in the evaluation of your warranty claim and the implementation of any remedy. When supplying replacement product or parts under this warranty, Opitz reserves the right to substitute product or parts of comparable value and design for any discontinued designs. This warranty is not transferable and applies only to the original consumer purchaser.

Opitz does not assume any responsibility for failures, breakage or causes which result from abuse, misuse, negligence, faulty operation, unauthorized repair or alteration, accident, fire, winds, floods, moisture, other unfavorable atmospheric conditions or other causes beyond Opitz's reasonable control or from failure to operate or maintain the product in accordance with the Opitz Operation Manual (a copy of which is provided to you with the product) or from normal wear and tear under normal usage. **OPITZ EXCLUDES AND WILL NOT PAY ANY INCIDENTAL AND CONSEQUENTIAL DAMAGES ARISING OUT OF THE PURCHASE OR USE OF THE PRODUCT.** By this Opitz means any loss, expense or damage other than to the product itself that may result from a defect in the product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

THE DURATION OF ANY IMPLIED WARRANTIES ARE LIMITED TO THE DURATION OF THE COVERAGE PROVIDED BY THIS LIMITED WARRANTY AS INDICATED ABOVE; PROVIDED, HOWEVER, THAT NOTHING IN THIS LIMITED WARRANTY SHALL GIVE YOU ANY IMPLIED WARRANTIES YOU WOULD NOT OTHERWISE HAVE, EXTEND THE SAME BEYOND THEIR CUSTOMARY DURATION, OR MAKE OPITZ LIABLE FOR ANY IMPLIED WARRANTIES THAT IT WOULD NOT BE LIABLE FOR IF THIS LIMITED WARRANTY HAD NOT BEEN GIVEN. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

This warranty shall apply only to product that is purchased and used within the United States. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

Date of Sale: Product Sold:

Product Serial Number: Expiration Date of the Warranty:

Name and Address of Buyer:

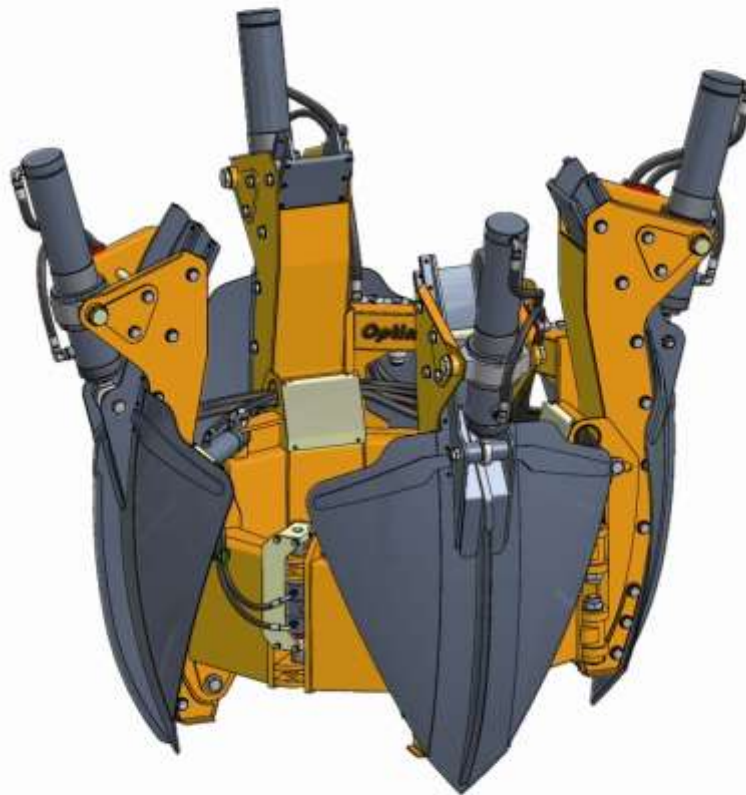
.....

.....

.....

Signature of Buyer:

SPARE PARTS ON TREE SPADE OPTIMAL 1400

**Manufacturer:**

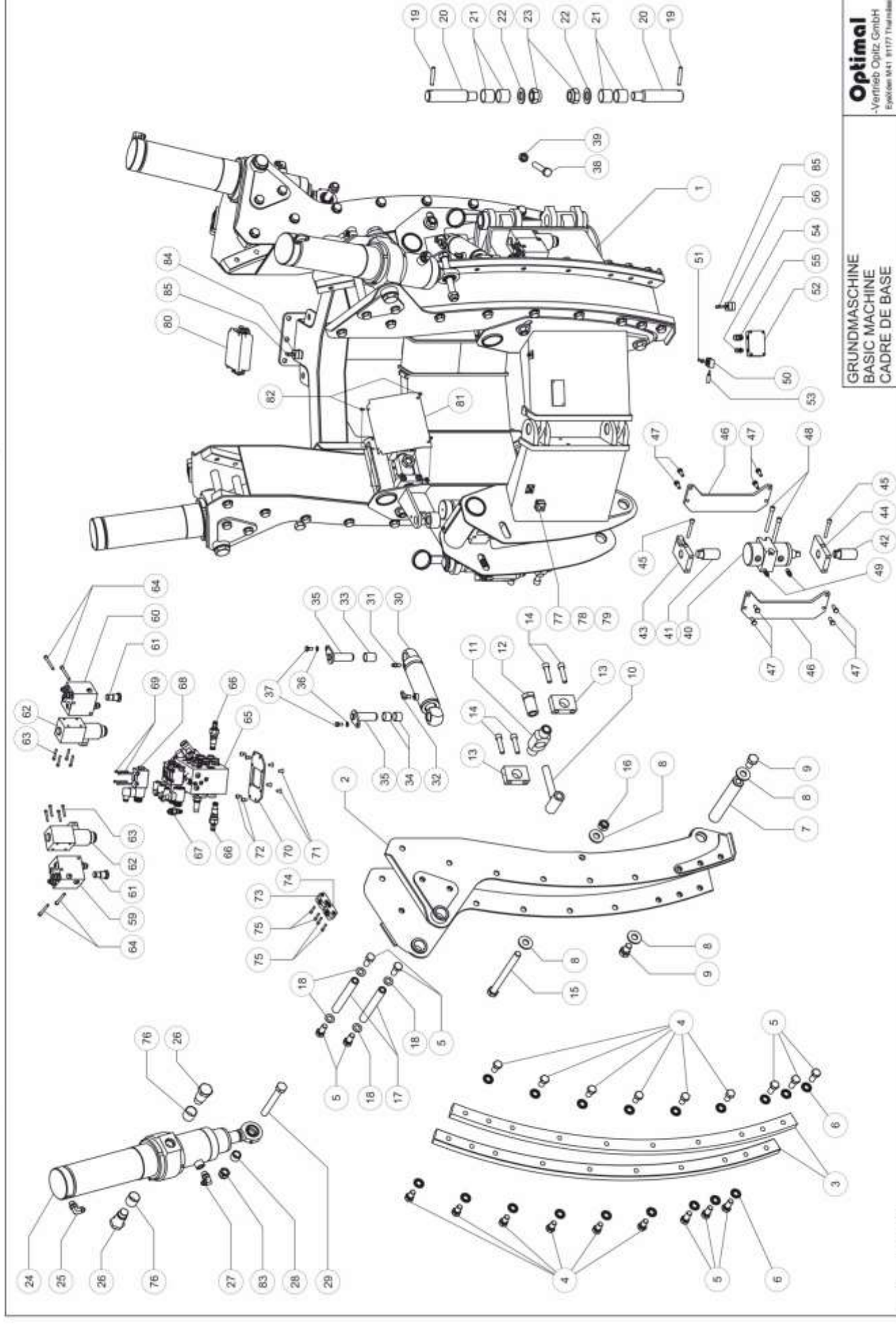
Optimal-Vertrieb Opitz GmbH
Eysoelden M 41
91177 Thalmaessing
Germany

Phone: ++ 49 - 9173 - 79 18 0
Fax: ++ 49 - 9173 - 79 18 49
eMail: info@opitz-optimal.com
web: www.opitz-optimal.com

Distributor:

Fieldworks Nursery Equipment
5191 Dawes Rd
Grand Bay AL 36541
U.S.A.

Phone: (251) 490-9871
Email: Fieldgrown@gmail.com
Email: Sales@optimaltreespades.com
Web: www.OptimalTreeSpades.com



GRUNDMASCHINE
BASIC MACHINE
CADRE DE BASE

Optimal
-Vertrieb Optiz GmbH
Eyschke M41 91177 Thuringen

Table 1**OPTIMAL 1400 - SPARE PARTS LIST****basic machine**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
1	1	main frame	
2	4	spade tower	3181410011
3	8	guide	3061400010
4	48	hex head screw M 20 x 35	50120035933
5	40	hex head screw M 20 x 45	50120045933
6	72	washer	506203
7	4	pivot pin ø 45	3071410040
8	16	washer 24	3111410130
9	8	hex head screw M 24 x 40	50124040933
10	4	adjustment block	3141410010
11	4	adjustment pin	3071410010
12	4	insert nut	3131410010
13	8	bearing pedestal	3181410230
14	16	socket head screw M 16 x 65	50116065912
15	4	bolt M 24 x 280	50124280931
16	4	hex nut M24, DIN 985	502240985
17	8	spacer tube	3111410080
18	16	washer 20, DIN 125	506920
19	4	tapered sleeve	5067120700
20	4	hinge pin	3071410020

Table 1**OPTIMAL 1400 - SPARE PARTS LIST****basic machine**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
21	8	bush	544455040
22	4	washer 33	506933
23	4	lock nut M 33 x 1,5	50233150985
24	4	spade cylinder	3010114010
25	4	union	515070511621
26	8	adjustment pin	3071410050
27	4	union	515070511221
28	4	bush	3111410090
29	4	bolt M 24 x 190	50124190931
30	2	gate cylinder	3010200100
31	2	union	515021000813
32	2	union	515070510813
33	2	bush	544303440
34	4	bush	544303425
35	4	pin	3071410031
36	4	spring washer 10, DIN 127	50610
37	4	bolt M 10 x 20	50110020933
38	2	bolt M 16 x 120 DIN 933	50120120933
39	2	hex nut M20, DIN 934	502200934
40	1	gate lock cylinder	3010300120

Table 1**OPTIMAL 1400 - SPARE PARTS LIST****basic machine**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
41	1	lock pin, top	3071400011
42	1	lock pin, bottom	3071400021
43	1	transvers plate, top	3181410190
44	1	transvers plate, bottom	3181410195
45	2	socket head screw M 10 x 70	50110070912
46	2	butt plate	3181410180
47	8	hex head screw M 10 x 30	50110030933
48	2	socket head screw M 12 x 100	50112100912
49	2	union	3991410010
50	1	holder for sensor	5990040760
51	2	socket head screw M 5 x 16	50105016912
52	2	relais box PK 102	5990038103
53	1	sensor	5990040754
54	1	cable fitting, M12 x 1,5	5997527702
55	1	cable fitting, M16 x 1,5	5997527714
56	1	pipe clamp	510RAPR-108
59	2	control block, LH	5471410030
60	2	control block, RH	5471410020
61	4	check valve	547VUCN12A
62	4	control valve NG 10	547010

Table 1**OPTIMAL 1400 - SPARE PARTS LIST****basic machine**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
63	16	socket head screw M6 x 40 DIN 912	50106040912
64	8	socket head screw M8 x 80 DIN 912	50108080912
65	1	control block	5471410010
66	2	pressure relief valve	547VSPC150
67	1	flow control valve	547OD21356
68	3	control valve NG 6	547001
69	12	socket head screw M 5 x 50 DIN 912	50105050912
70	1	fixing plate	3151410020
71	4	hex bolt M 8 x 16 DIN 7991	501080167991
72	4	socket head screw M 8 x 16	50108016912
73	4	pipe clamp	510RAPR-325
74	4	pipe clamp	510RAPR-320
75	16	socket head screw M 6 x 35	50106035912
76	8	bush	544404440
77	1	pipe clamp DS112/12	510112
78	1	cover	5100DP-B1
79	1	bolt M 6 x 35 DIN 931	50106035931
80	1	cable distributor box	5998K50290
81	4	fender	3151410070
82	16	hex bolt M 6 x 12	501060127380

Table 1

OPTIMAL 1400 - SPARE PARTS LIST

basic machine

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
83	4	lock nut M 24	502240985
84	1	pipe clamp	510RAPR-112
85	4	socket head screw M 6 x 20 DIN 912	50106020912

Ersatzteilliste - Spare Parts List - Liste De Pièces De Rechange **Tafel - Table - Feuille 2**

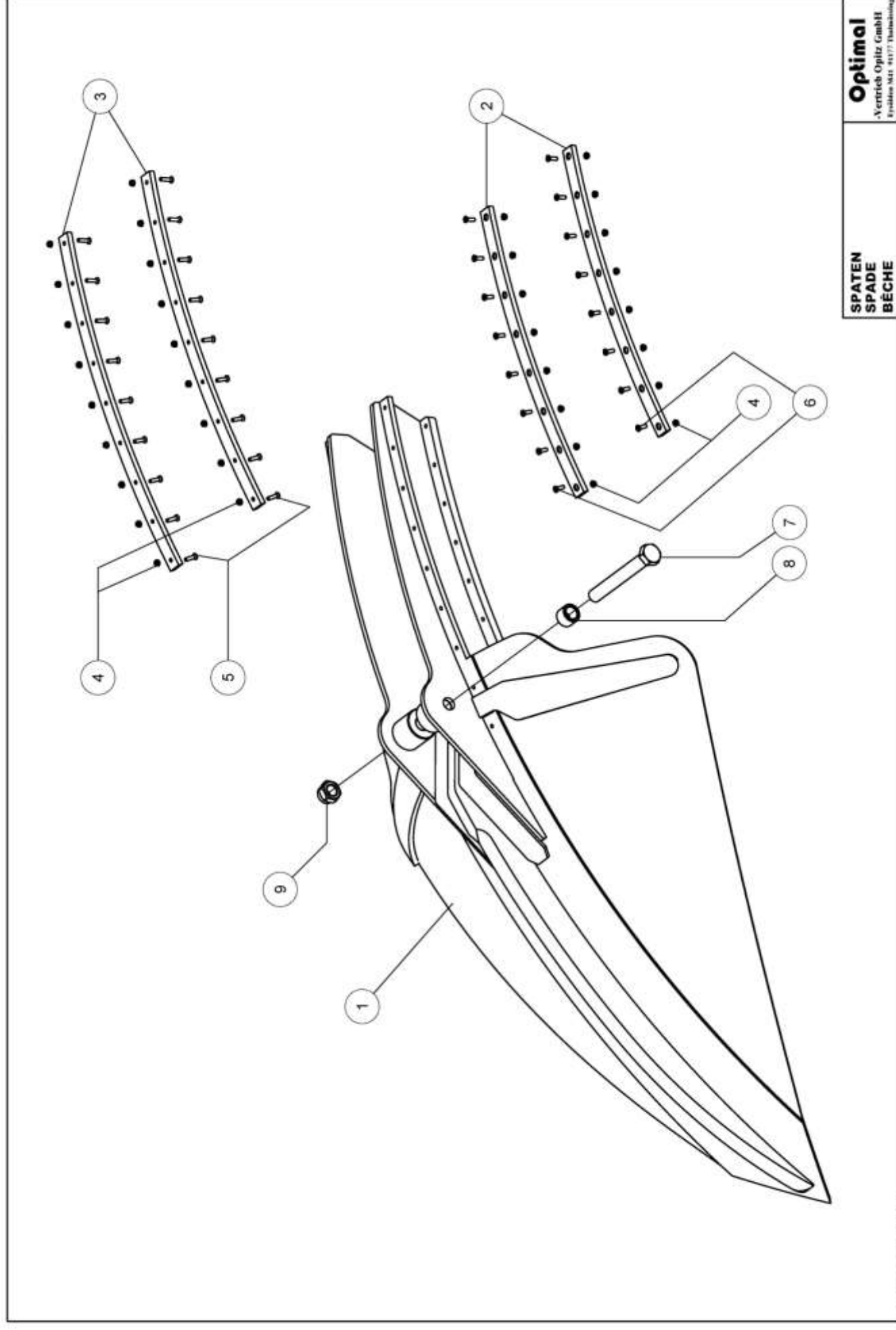
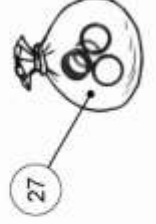
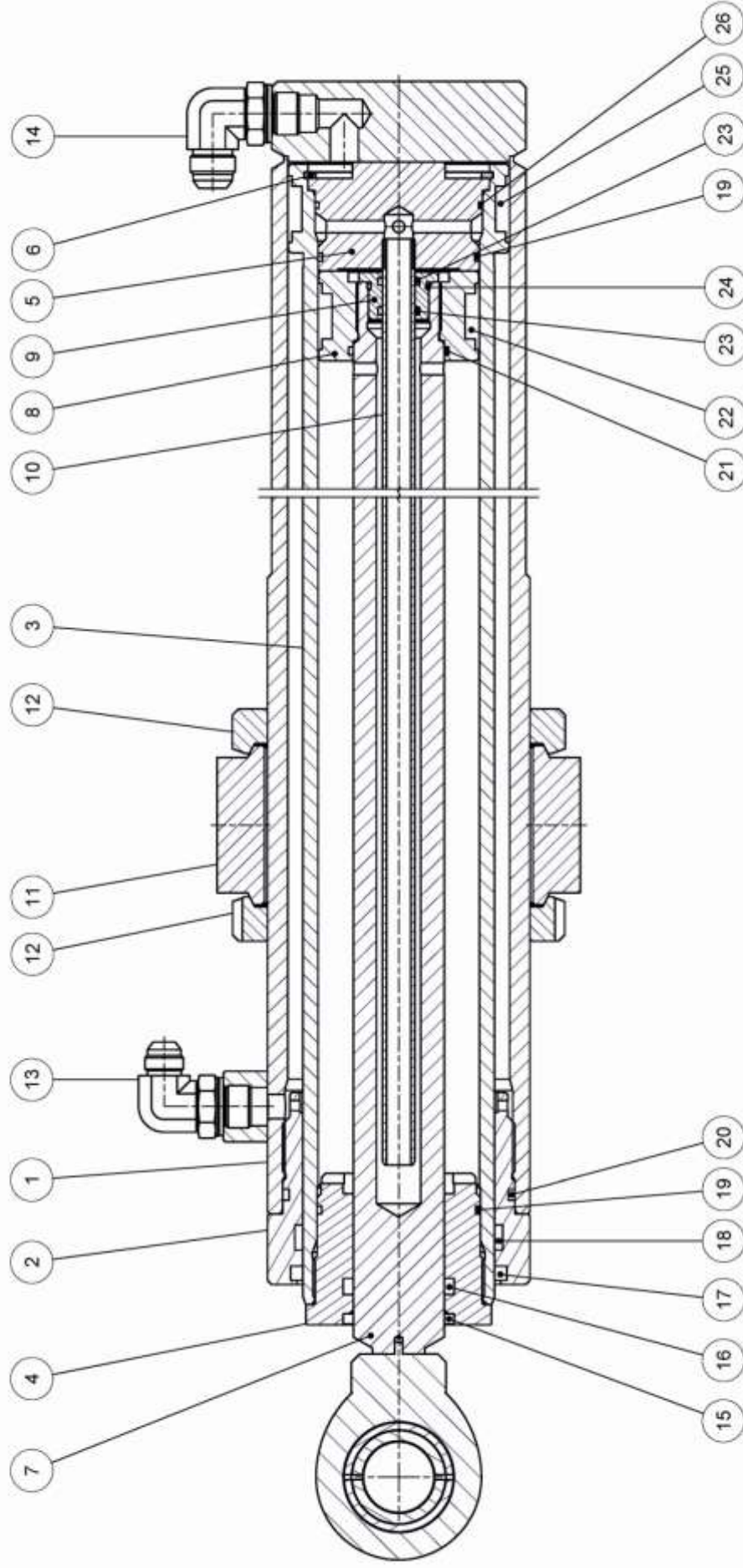


Table 2

OPTIMAL 1400 - SPARE PARTS LIST

spade

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
1	4	spade, complete	
2	8	plastic guide, short	30614024000
3	8	plastic guide, long	30614024002
4	136	lock nut M 6	502060985
5	72	countersunk socket screw M 6 x 25	501060257991
6	64	countersunk socket screw M 6 x 20	501060207991
7	4	bolt M 24 x 190	50124190931
8	4	bush	3111410090
9	4	lock nut M 24	502240985



SPATENZYLINDER
SPADE CYLINDER
VERIN DE BÈCHE

Optimal
 Vertrieb Optitz GmbH
 Fiedler Str. 41/77 D-48149

Table 3**OPTIMAL 1400 - SPARE PARTS LIST****telescopic spade cylinder 3010114010**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
1	1	cyinder body	302020012
2	1	guide bush	31102300
3	1	cyinder body	302020031
4	1	guide bush	31180453751
5	1	bottom plate	30402401
6	1	locking ring	599029030
7	1	cyinder body	303020041
8	1	piston	312022011
9	1	guide bush	31102303
10	1	cylinder body r	302020051
11	1	cylinder suspension	3091410010
12	2	slotted nut KM 26	31350326
13	1	elbow, male	515070511221
14	1	elbow, male	515070511621
15	1	scraper	5160345
16	1	rod seal S 8 - 45	5160245
17	1	scraper	51603095
18	1	rod seal RS/L 95103	51602095103
19	2	o-ring	5170745030
20	1	o-ring	5171050040

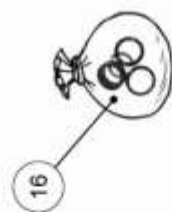
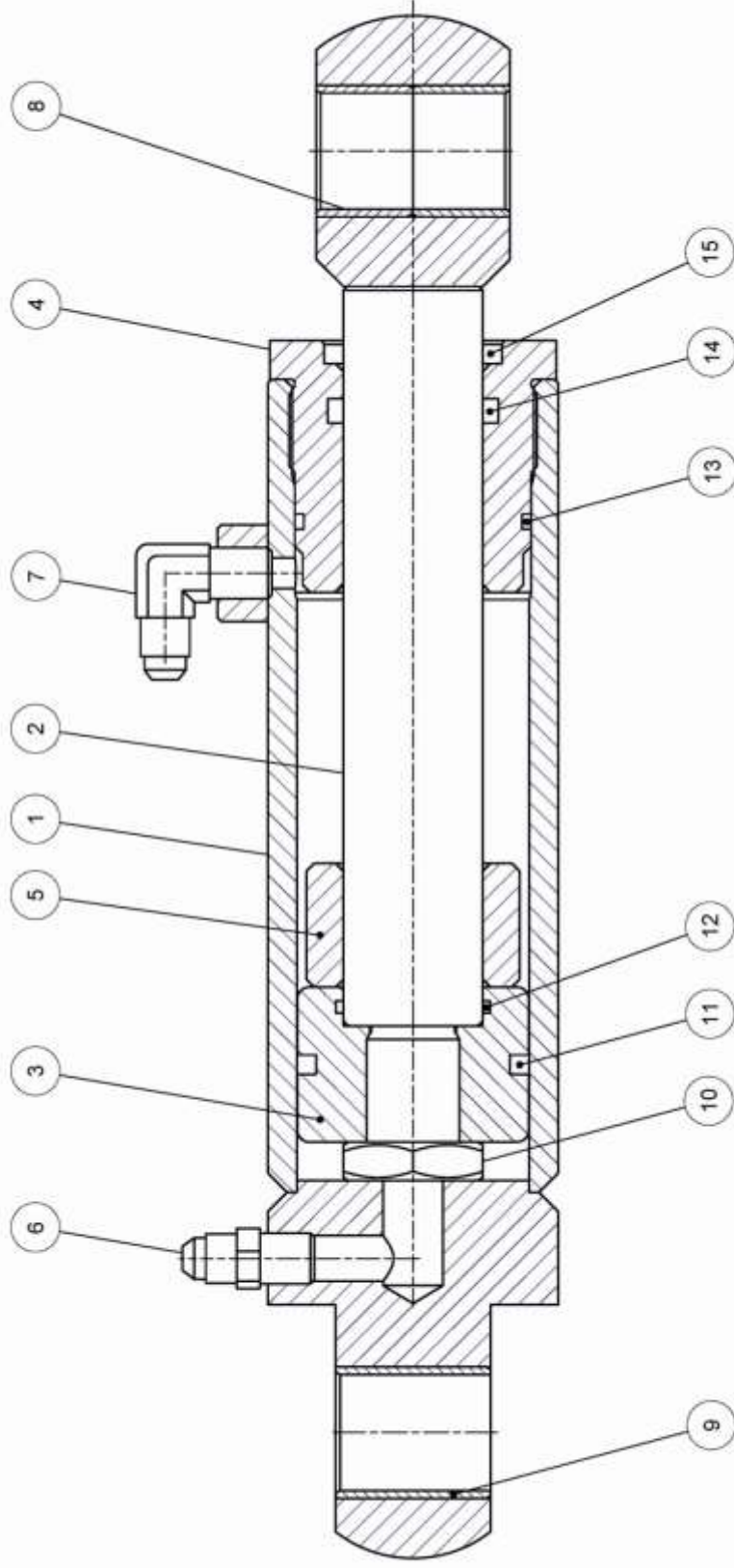
Table 3

OPTIMAL 1400 - SPARE PARTS LIST

telescopic spade cylinder

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
21	1	o-ring	517045030
22	1	piston seal	516048066
23	2	rod seal S16/2016	51602016206
24	1	o-ring 27 x 2.5	5170270025
25	1	piston seal	51604110096
26	1	o-ring 78 x 2.5	517078025
27	1	seal kit complete	51600026011

Ersatzteilliste - Spare Parts List - Liste De Pièces De Remplacement **Tafel - Table - Feuille 4**



ÖFFNUNGSZYLINDER
GATE CYLINDER
VÉRIN D'OUVERTURE

Optimal
 Vertrieb Optiz GmbH
 Freiländer Str. 41/77 D-42699 Solingen

Table 4**OPTIMAL 1400 - SPARE PARTS LIST****gate cylinder**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
1	1	cylinder body .	3020600120
2	1	piston rod ø 36 x 231	3030360160
3	1	piston, HZ 60/36	3126036240
4	1	guide bush HZ 60/36	3116036365
5	1	sleeve	3111410100
6	1	union	515021000813
7	1	union	515070510813
8	2	bush 3034-25	544303425
9	1	bush 3034-40	544303440
10	1	nut M 24 x 1,5	50224150936
11	1	piston seal	5160160
12	1	o-ring 36 x 2,5	5170360025
13	1	o-ring 55,2 x 3	5170552030
14	1	piston rod seal 36 x 44 x 6	5160236446
15	1	scraper 36 x 46 x 5/7	5160336
16	1	seal kit complete	516006036601

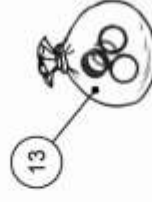
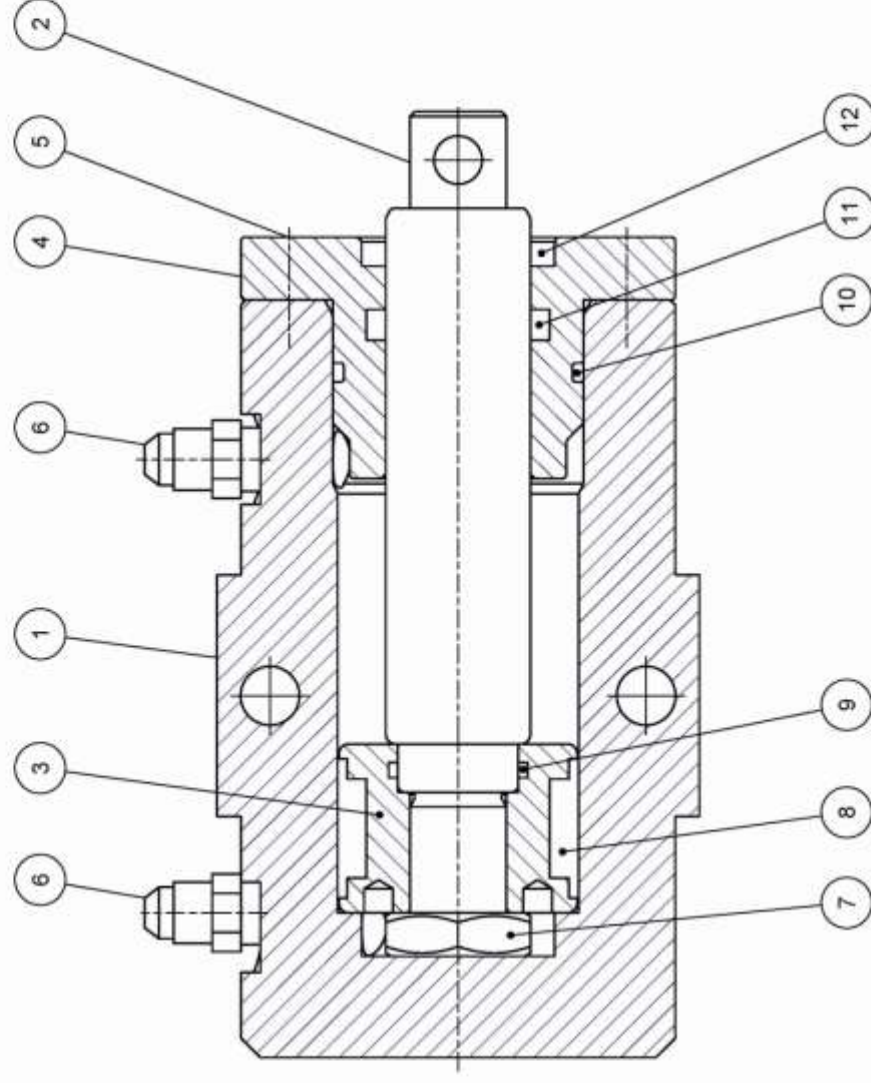


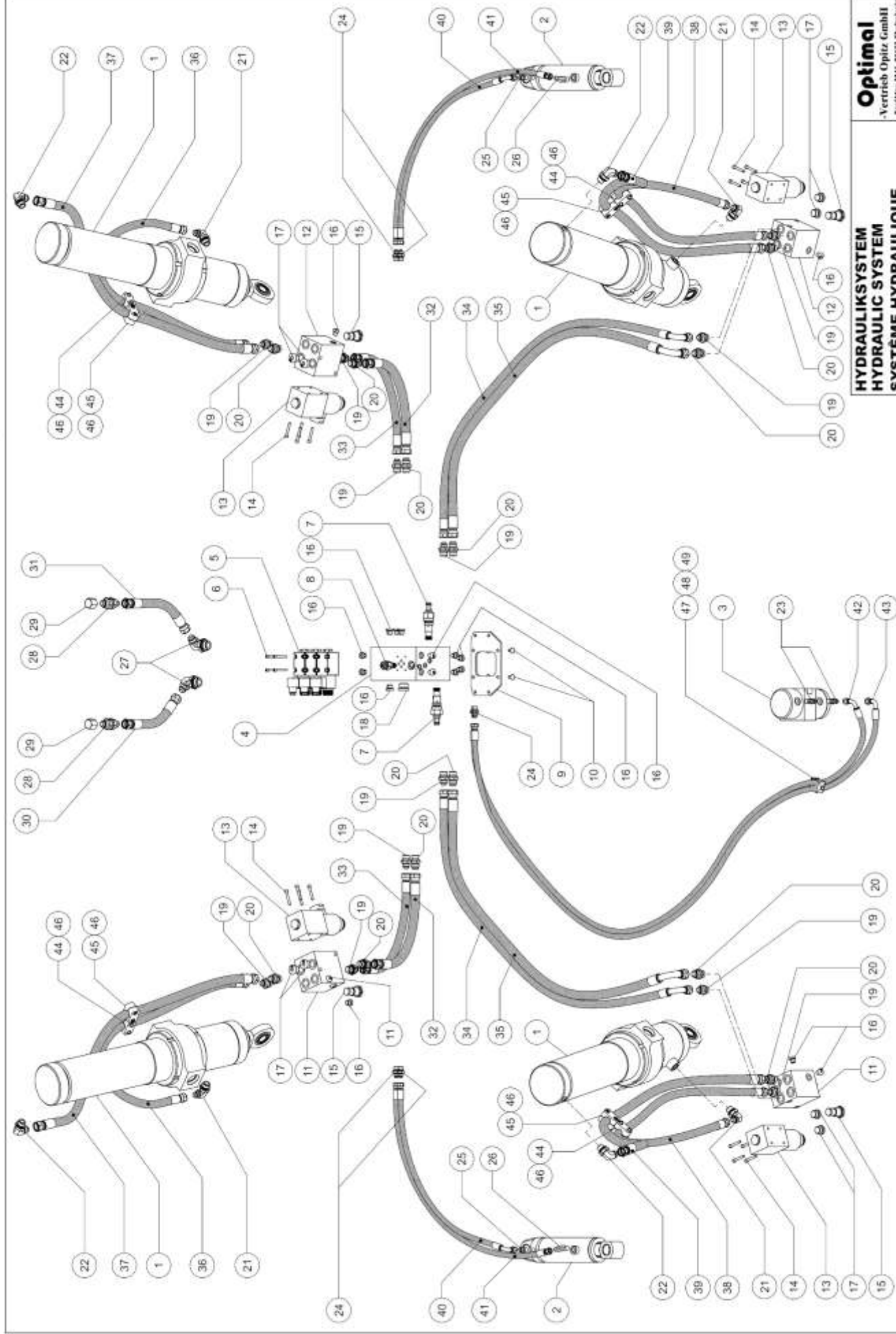
Table 5

OPTIMAL 1400 - SPARE PARTS LIST

gate lock cylinder

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
1	1	cylinder body, HZ 50/30	3020500160
2	1	piston rod ø 30 x 175	3030300150
3	1	piston, HZ 50/30	3125030250
4	1	guide bush, HZ 50/30	3115030020
5	6	socket head screw M 8 x 20	50108020912
6	2	union	3991410010
7	1	nut M 20 x 1,5	50220150936
8	1	piston seal 5038	51604050038
9	1	o-ring 25 x 2,5	5170250025
10	1	o-ring 45,2 x 3	5170452030
11	1	piston rod seal S 8 – 30	5160230
12	1	scraper P7 - 30	5160330
13	1	seal kit complete	516005030612

Ersatzteilliste - Spare Parts List - Liste De Pièces De Rechange **Tafel - Table - Feuille 6**



HYDRAULIKSYSTEM
HYDRAULIC SYSTEM
SYSTÈME HYDRAULIQUE

Optimal
 Vertrieb Optiz GmbH
 Exzellenz-Mat 81777 Thaldorf

Table 6**OPTIMAL 1400 - SPARE PARTS LIST****Hydraulic System**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
1	4	spade cylinder	3010114010
2	2	gate cylinder	3010200100
3	1	gate lock cylinder	3010300120
4	1	control block	5471410010
5	3	control valve NG06	547001
6	12	socket head screw M 5 x 50 DIN 912	50105050912
7	2	pressure relief valve	547VSPC150
8	1	flow control valve	547OD21356
9	1	fixing plate	3151410020
10	4	hex bolt M 8 x 16 DIN 7991	501080167991
11	2	control block, LH	5471410030
12	2	control block, RH	5471410020
13	4	control valve NG10	547010
14	16	socket head screw M6 x 40 DIN 912	50106040912
15	4	check valve	547VUCN12A
16	23	plug VSTI 1/4"	515VSTI1/4
17	8	plug VSTI 1/2"	515VSTI1/2
18	1	plug VSTI 3/4"	515VSTI3/4
19	12	union	515020231221
20	12	union	515020231621

Table 6**OPTIMAL 1400 - SPARE PARTS LIST****Hydraulic System**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
21	4	elbow, male	515070511221
22	4	elbow, male	515070511621
23	2	union	3991410010
24	6	union	515020230813
25	2	union	515021000813
26	2	union	515070510813
27	2	union	515070391626
28	2	union 7/8-14UNF	5150300216
29	2	plug	5150103316
30	1	hydraulic hose NW16, length 11,4"	513162029011
31	1	hydraulic hose NW16, length 13"	513162033011
32	2	hydraulic hose NW12, length 16,5"	513122042011
33	2	hydraulic hose NW16, length 17,3"	513162044011
34	2	hydraulic hose NW12, length 52"	513122132013
35	2	hydraulic hose NW16, length 52"	513162132013
36	2	hydraulic hose NW12, length 38,5"	513122098011
37	2	hydraulic hose NW16, length 39,4"	513162100011
38	2	hydraulic hose NW12, length 54"	513122137011
39	2	hydraulic hose NW16, length 54,3"	513162138011
40	2	hydraulic hose NW6, length 30,3"	513062077013

Table 6

OPTIMAL 1400 - SPARE PARTS LIST

Hydraulic System

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
41	2	hydraulic hose NW6, length 36,2"	513062092011
42	1	hydraulic hose NW6, length 87,4"	513062222013
43	1	hydraulic hose NW6, length 88"	513062224013
44	4	pipe clamp	510RAPR-320
45	4	pipe clamp	510RAPR-325
46	16	socket head screw M 6 x 35	50106035912
47	1	pipe clamp DS112/12	510112
48	1	cover	5100DP-B1
49	1	bolt M 6 x 35 DIN 931	50106035931

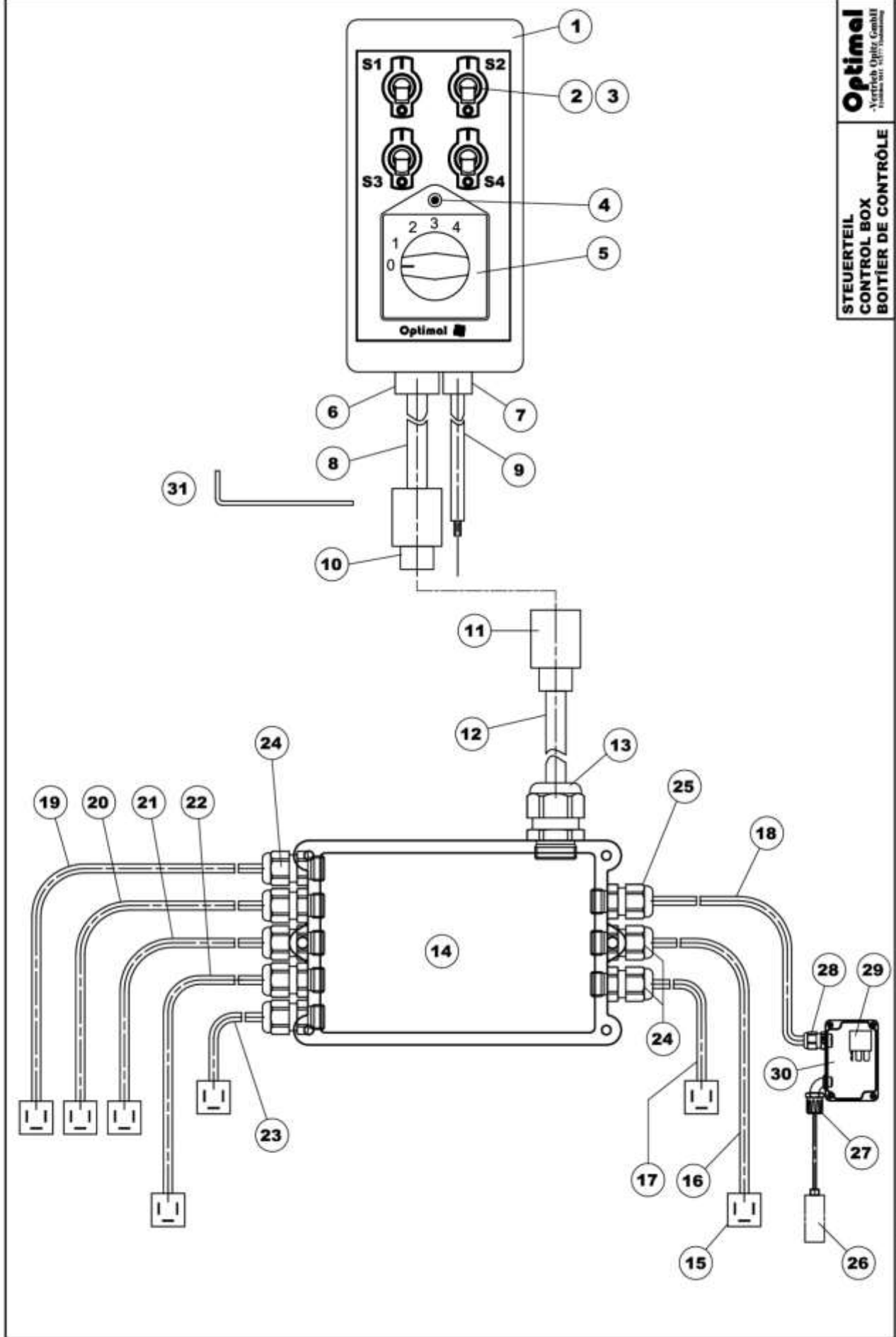


Table 7**OPTIMAL 1400 - SPARE PARTS LIST****Electrical System**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
1	1	casing	3981110010
2	4	toggle switch	5470700728
3	4	name plate	5470700168
4	1	indicator lamp, 12V	5997149845
5	1	rotary switch 0,1,2,3,4	5470A242600E
6	1	straight cable fitting M20x1,5	5997527727
7	1	straight cable fitting M12x1,5	5997527701
8	1	cable 12x1,5 – 560cm (220,5")	5121215
9	1	cable 2x1,5 – 170cm (67")	5122015
10	1	13-pole socket	5998JB005949
11	1	13-pole plug	5998JA005951
12	1	cable 12x1,5 – 250cm (98")	5121215
13	1	straight cable fitting M20x1,5	5997527727
14	1	distributor box	3981410010
15	7	standard plug	54743650
16	1	cable 2x1,5 – 198cm (78") – blade 1	5122015
17	1	cable 2x1,5 – 55cm (22") – blade 3	5122015
18	1	cable 3x1,5 – 242cm (95") – safety switch	5123015
19	1	cable 2x1,5 – 56cm (22") – optional function	5122015
20	1	cable 2x1,5 – 54cm (21") – gate lock	5122015

Table 7**OPTIMAL 1400 - SPARE PARTS LIST****Electrical System**

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Part Number</u>
21	1	cable 2x1,5 – 57cm (22,5“) – gate	5122015
22	1	cable 2x1,5 – 198cm (78“) – blade 2	5122015
23	1	cable 2x1,5 – 55cm (22“) – blade 4	5122015
24	1	straight cable fitting M12 x 1,5	5997527702
25	7	straight cable fitting M16x1,5	5997527714
26	1	sensor .	5990040754
27	1	cable fitting, M12 x 1,5 .	5997527702
28	1	cable fitting, M16 x 1,5	5997527714
29	1	relais	5994RD3520
30	1	relaisbox PK 102	5990038103
31	1	bracket for 13-pole socket.	3159990010